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CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 3 February 2003 with an application for Letters Patent number 524005 made by MATTHEW KEITH MASON.

Dated 2 March 2004.

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Neville Harris
Commissioner of Patents, Trade Marks and Designs



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Patents Form No. 4

Our Ref: WEJ504239

Patents Act 1953
PROVISIONAL SPECIFICATION
CONNECTOR

I, MATTHEW KEITH MASON, a citizen of New Zealand, of 75A Beresford Street, Bayswater, Auckland, New Zealand do hereby declare this invention to be described in the following statement:

PT0457297

CONNECTOR**FIELD OF THE INVENTION**

5 This invention relates to a connector and a connection method for connecting a membrane to a fastener such as a rope. The invention is directed particularly, but not solely, to connecting a yacht sail to a sheet.

BACKGROUND

10 Membranes such as yacht sails are usually provided with an eyelet or D-Ring that is used as a connector to allow the sail to be fastened in some way, for example by connection to a sheet in order to control or secure the sail.

15 Eyelets and D-Rings have the disadvantage that snap shackles or knots are usually required to establish a connection to the membrane, and these can fail. Also, particularly when used to fasten a sail, snap shackles or knots can snag on shrouds or other fittings, and damage the fittings.

OBJECT

20 It is an object of the invention to provide a connector and/or a connection method which will at least go some way toward overcoming the foregoing disadvantages, or which will at least provide a useful alternative.

SUMMARY OF THE INVENTION

In one aspect the invention broadly consists in a membrane connector having a substantially annular body and an elongate projection dependent from the body and projecting into the interior of the substantial annulus.

30 Preferably the body includes membrane connection means to affix the connector to a membrane.

Preferably the projection is adapted to engage with a fastener.

35 Preferably the projection includes retaining means to assist retention of the fastener.

In a further aspect the invention may broadly be said to consist in a connector for allowing a fastener to be connected to a membrane to allow a force to be applied to the membrane in a selected direction, the connector including a body having membrane connection means to allow the connector to be affixed to the membrane, and a projection adapted to engage with the fastener, the projection being dependent from the body and having a longitudinal axis substantially parallel to the selected direction.

5 Preferably the projection is provided substantially in the plane of the membrane, or at least substantially in the plane of a part of the membrane adjacent to the connector.

10 Preferably the body comprises a substantial annulus.

15 Preferably the projection projects into the interior of the substantial annulus.

20 Preferably the membrane connection means include one or more parts of the substantial annulus.

25 Preferably the connection means include one or more openings provided in the body for engagement with the membrane or reinforcing members of the membrane.

30 Preferably the projection includes retaining means to retain the fastener.

35 Preferably the retaining means protrudes substantially perpendicularly from the projection.

Preferably the projection and retaining means together form a substantial T-shape.

Preferably the fastener comprises an elongate flexible member such as a rope, and in the most preferred embodiment comprises a rope having a loop therein for location about the projection.

Preferably the apparatus includes the membrane. Preferably the membrane includes a cover to substantially cover the connector.

35 In a further aspect the invention broadly consists in a method of connecting a membrane to a fastener, the method comprising the steps of providing a membrane including a

connector according to any one of the preceding statements of invention, providing a fastener, and engaging the fastener with the projection

5 Preferably the method includes the step of applying a force to the fastener to apply the force to the membrane in the selected direction.

Preferably the method includes the step of using a rope as the fastener.

10 Preferably the method includes the step of forming a loop in the rope and engaging the loop with the projection.

In a further aspect the invention broadly consists in a sail including a connector according to any one of the preceding statements of invention.

15 Preferably the connector is provided in the clew.

Preferably the fastener comprises a sheet.

Alternatively the fastener comprises a strop.

20 In a further aspect the invention broadly consists in a membrane connection assembly including a connector according to anyone of the preceding statements of invention and a fastener for engagement with the connector, the connector in use being provided attached to the membrane to allow a force to be applied to the membrane in a selected direction.

25 Preferably the fastener comprises a rope.

Definitions: Unless clearly stated to the contrary:

30 "membrane" herein means a substantially flexible sheet material including without limitation a sail, shade sail, tarpaulin or flexible sheet for architectural purposes;

"substantially annular" or "substantial annulus" means a generally annular shape and includes a generally annular shape that is an incomplete annulus;

"comprise" or variations such as "comprising" herein is to be interpreted in an inclusive sense.

DRAWING DESCRIPTION

Figure 1 is an elevation of a connector according to the invention.

5 Figure 2 is an elevation of the connector of Figure 1 in use with a membrane and a fastening rope.

Figure 3 is a plan view of Figure 2.

10 Figure 4 is an elevation of the connector of Figure 1 in use with a membrane such as a sail and an alternative fastening arrangement to that shown in Figure 2.

Figure 5 is a plan view of Figure 4.

15 Figure 6 is an elevation of the connector with a membrane and a cover in the open position.

Figure 6A is an elevation of the arrangement of Figure 6 with the cover in a partially closed position, and

20 Figure 7 is an elevation of the arrangement of Figures 6 and 6A with the cover in the closed position.

DESCRIPTION OF PREFERRED EMBODIMENT

25 Referring to Figure 1, a connector is shown generally referenced 1. The connector has a body 2 which in the preferred embodiment as shown in Figure 1 substantially comprises a substantial annulus or ring. However, it is not essential that the body is provided as a closed annulus or ring, and those skilled in the art, will, upon reading the following 30 description, appreciate that other body shapes or forms may be used.

As can be seen from Figure 1, the body includes apertures (4) and (6) which may be used to establish a connection with a membrane by disposing support loops through the apertures (4) and (6) and attaching the ends of the loops to the membrane. Also, the body (2) in conjunction with central aperture (8) also allows further support loops or straps to be connected to the body and affixed to a membrane. The connector is preferably

disposed adjacent to the edge or corner of the membrane.

Dependent from the body is a substantially elongate projection or spigot (10) which has a retaining portion (12).

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Referring now to Figure 2, the connector of Figure 1 is shown in use with a membrane (14). A fastener such as a rope (including a wire rope for example) (16) has a loop (18) provided therein which is provided about the projection (10). The retaining portion (12) assists in retaining the loop (18) about the projection (10) in situations where tension may be removed from the rope. The membrane (14) includes support tapes of ribbons (20) that are engaged with apertures (4), (6) and (8) of the connector and are fastened to the membrane, for example by sewing or stitching.

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In Figure 3, the arrangement of Figure 2 is shown in plan view in which it can be seen that the projection (10) is substantially in the same plane as the body of the connector and in substantially the same plane as the portions of the membrane that are adjacent to the connector. A force applied to the rope (16) in a direction shown by arrow (22) shows that the arrangement provides an effective connection which is very unlikely to come apart, even when the force is removed. It also places only a small turning force on the connector. The overall assembly does not provide any significant protrusions on which other fittings are likely to snag.

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Turning to Figure 4, the most preferred arrangement of using the connector of the invention to fastener membrane is shown. A loop of flexible elongate material such as wire rope or Kevlar™, for example, (24) is looped through loop (18) and then is in turn looped over projection (10) from each side of the connector. As shown in Figure 5, this has the advantage that the forces are evenly distributed on either side of the connector when a force is applied in the direction of arrow (22). Those skilled in the art will appreciate that the strop (24) may be provided from a variety of different materials and loop (18) may comprise a loop in a rope or a wire rope, or could be provided in a rigid material.

35

Turning now to Figure 6, the connector (1) is shown disposed in a membrane (14) with a cover provided on the membrane. The cover comprises two cover flaps (26) and (28) which are shown in an open, unfolded position. The external side of cover (28) has a Velcro strip™ (30) and the internal side of cover (26) has a corresponding Velcro strip™

(32). To use the cover, flap (28) is firstly folded down as shown by arrow (34) to expose the Velcro strip ™ (30). This is shown in Figure 6A. Then flap (26) is folded over the exterior of flap (28) as shown by arrow (36) so that Velcro strips ™ (30) and (32) engage. The resultant folded construction is shown in Figure 7. Connection means other than Velcro ™ may be used to fasten the cover.

Once a fastener such as rope (18) or stop (24) has been connected to projection (10), the cover flaps can be folded over to cover the assembly. This has the advantages that the fastener is unlikely to come astray, and if a membrane is likely to be moved (for example when it is provided in the clew of a sail), then it is less likely to snag or damage other objects or fittings.

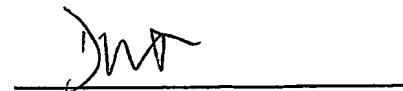
From the foregoing it will be seen that a connector is provided which has the advantages of being easy to use, relatively cheap to manufacture and unlikely to fail (no moving mechanical parts are required such as snap shackles), and unlikely to snag on adjacent fittings.

In particular, the connector has advantages when used to secure a sail. When a sail is changed, the connector facilitates rapid unfastening and the new sail (including another connector according to the invention) is rapidly and easily set. When the connector is used in the clew of a headsail such as a genoa, it is unlikely to snag on shrouds, and can be covered to prevent damage to fittings such as spars. The connector can be constructed from a variety of materials for example metals, plastics or composite materials and can be formed by casting, moulding, forging or machining.

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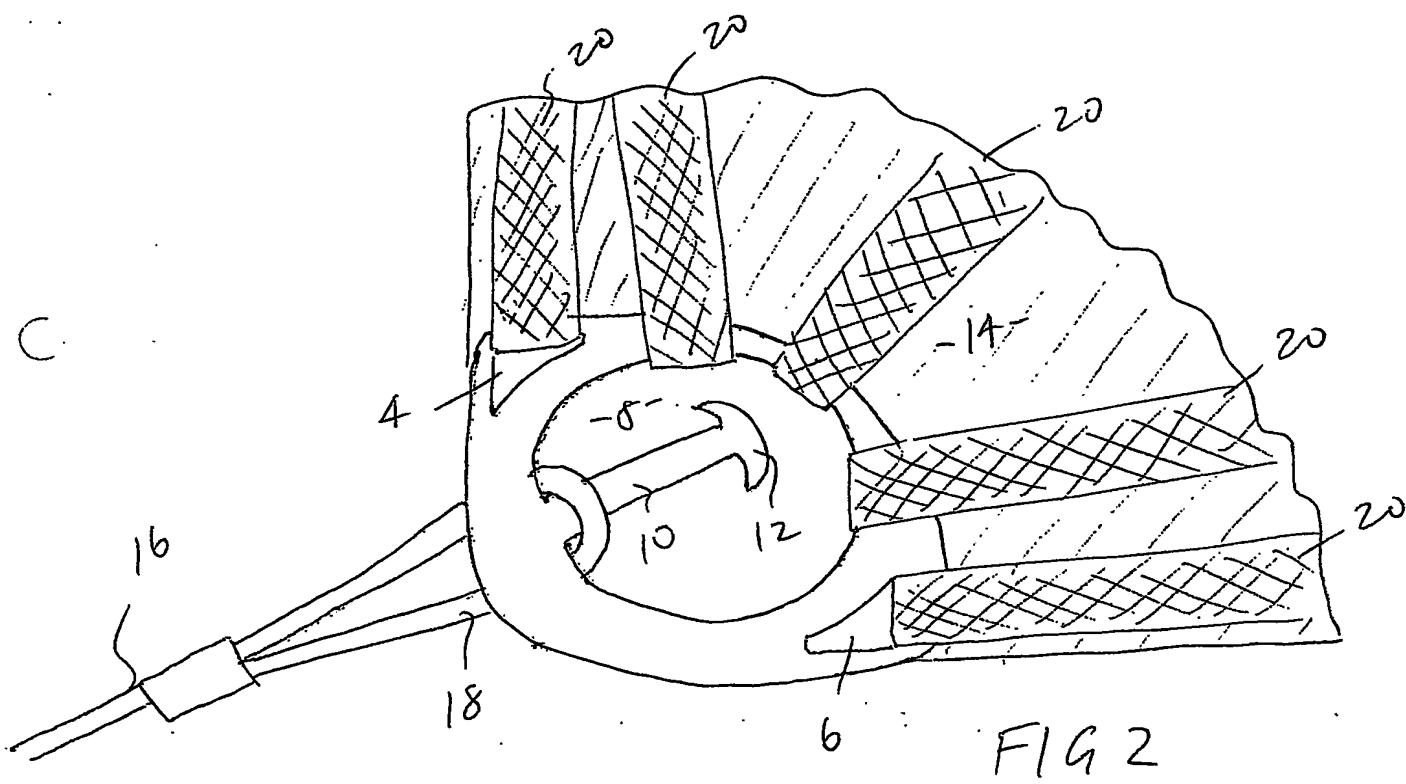
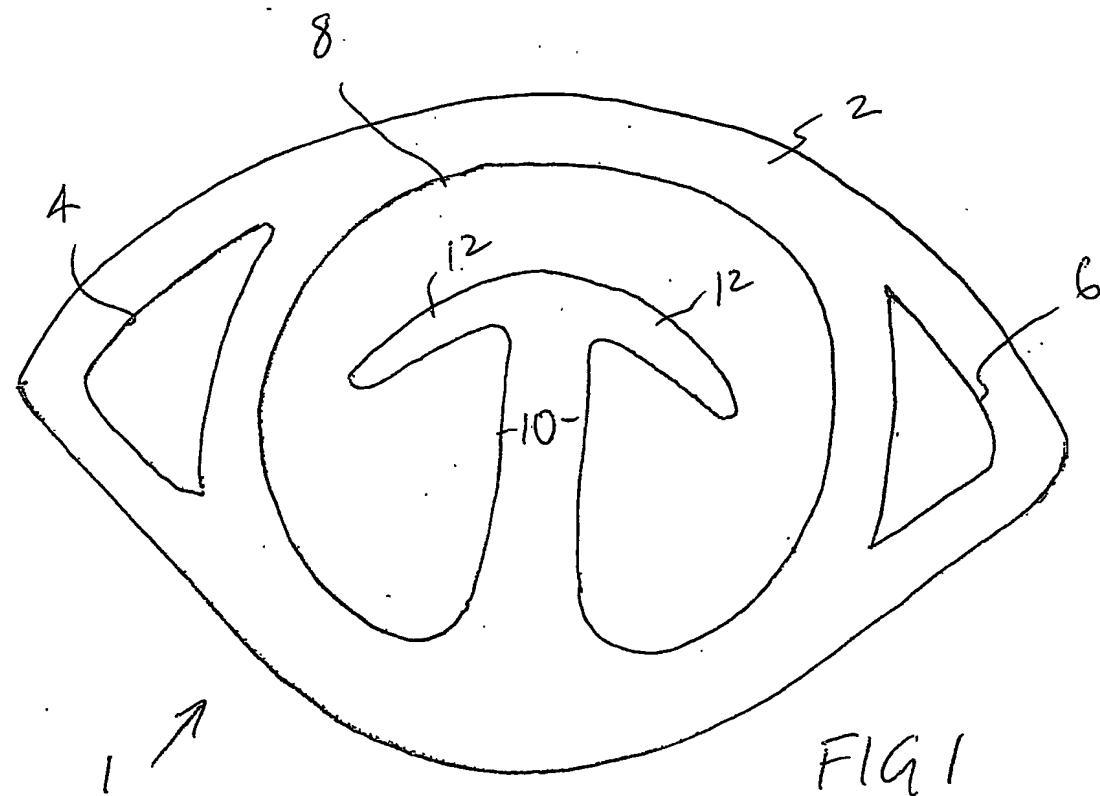
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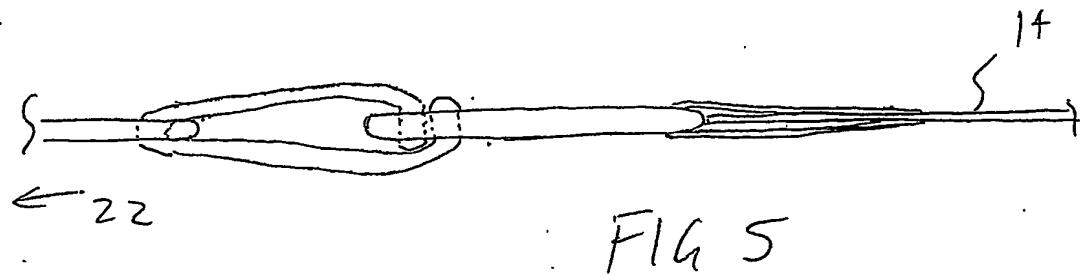
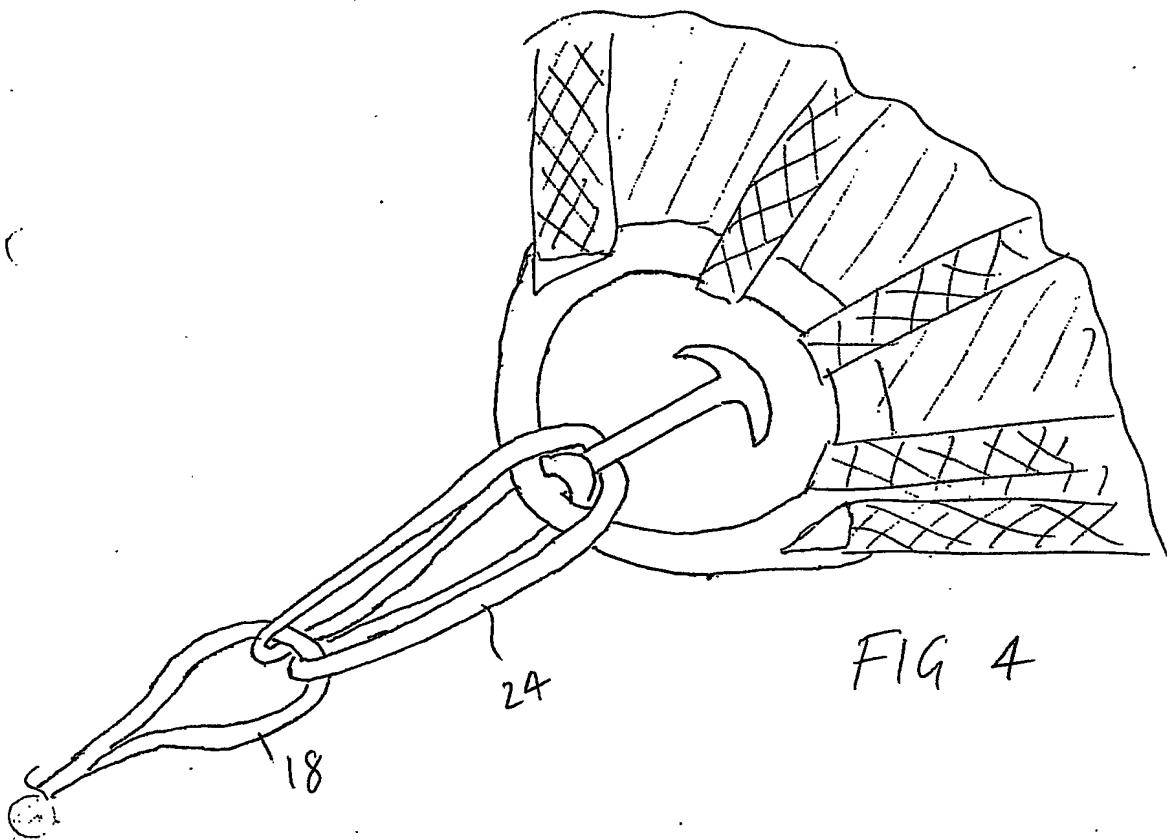
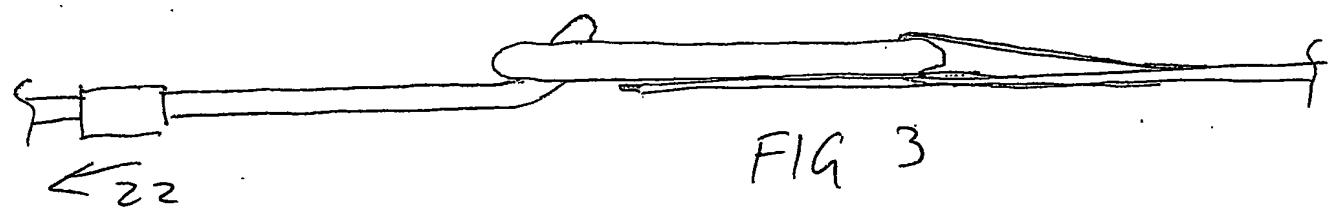
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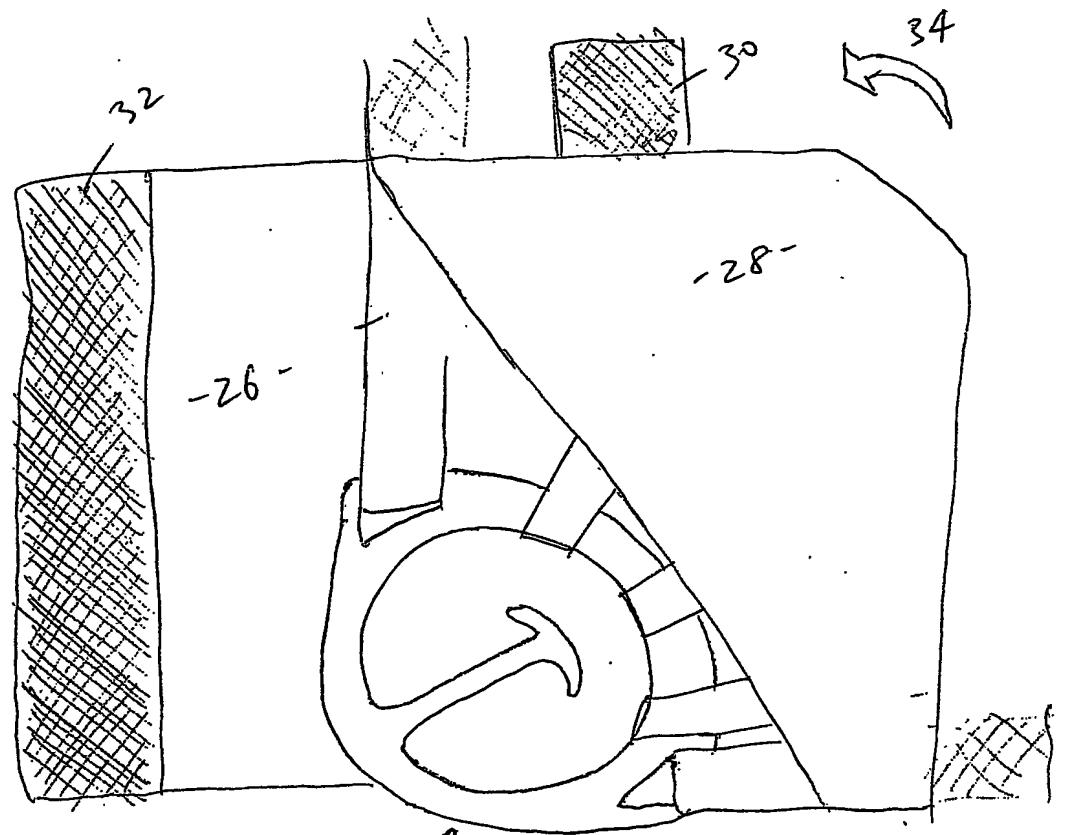


FIG 6

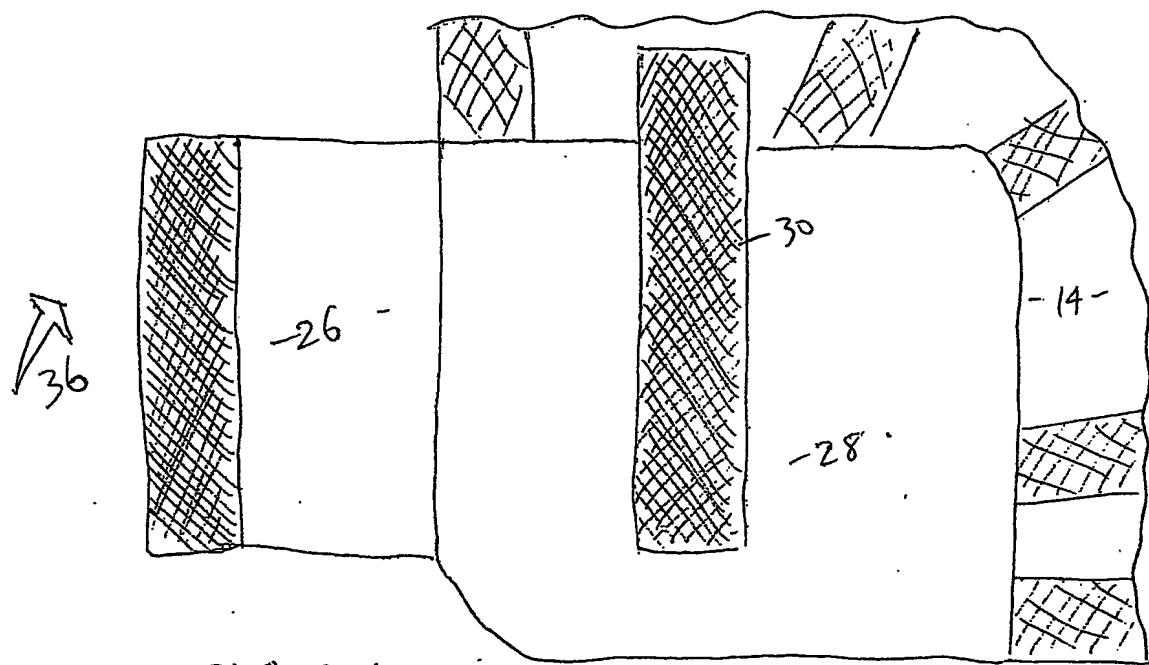


FIG 6 A

5240 n 5

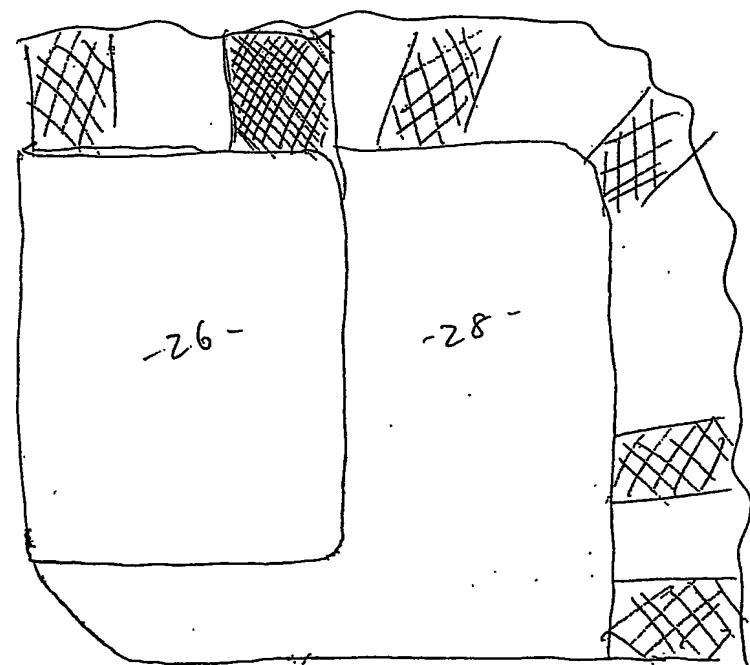


FIG. 7